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Effect of Fibre Weight Fraction on the Electrical Conductivity of Continuous Fibre Reinforced Conductive Composites

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Abstract :

SIP-FRP-01 project aims at the development of conductive polymer composites for Electromagnetic Interference shielding (EMI) applications. Highly conductive materials are best suited for electromagnetic shielding. Metals are the conventional materials used for electromagnetic shielding. But their applications are limited due to their high densities. Polymers with light weight are generally insulators in nature. They can be made conductive by dispersing either the particulate conductive fillers or by reinforcing with continuous conductive fibres. Particulate polymer composites are not suited for load bearing structural applications due to their limited mechanical strength . In recent times , Carbon fiber reinforced polymer composites are gaining importance in air-craft structural applications due to their low density, good processability, and high specific strength. Further , Carbon fibers being conductive in nature, impart electrical conductivity to these composites. Hence the conductivity of these composites is dependent on the carbon fiber weight fraction contributed to the composite. Hence CFRP composites with higher fiber fraction are becoming alternatives to metals in EMI shielding applications. This document brings out the results of systematic studies carried out to realize the effect of fiber fraction variation on the electrical conductivity of the composite.